Extension Service
West Virginia University.

Disaster and Emergency Management Resources

Introduction to Thunderstorms

Definitions

- **Thunderstorm -** A thunderstorm is formed from a combination of moisture, rapidly rising warm air, and a force capable of lifting air such as a warm and cold front or a mountain. Thunderstorms may occur singly, in clusters, or in lines. Thus, it is possible for several thunderstorms to affect one location in the course of a few hours. Some of the most severe weather occurs when a single thunderstorm affects one location for an extended time.

- **Lightning -** Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second. The rapid heating and cooling of air near the lightning causes thunder.

Severe Thunderstorm Watches and Warnings

- A ***severe thunderstorm watch*** is issued by the National Weather Service when the weather conditions are such that a severe thunderstorm (damaging winds of 58 miles per hour or more or hail three-fourths of an inch in diameter or greater) is likely to develop. This is the time to locate a safe place in the home and tell family members to watch the sky and listen to the radio or television for more information.

- A ***severe thunderstorm warning*** is issued when a severe thunderstorm has been sighted or indicated by weather radar. At this point, the danger is very serious. Everyone should go to a safe place, turn on a battery-operated radio or television, and wait for the "all clear" by the authorities.

Thunderstorm Facts

- Thunderstorms can bring heavy rains (which can cause flash flooding), strong winds, hail, lightning, and tornadoes. In a severe thunderstorm, get inside a sturdy building and stay tuned to a battery-operated radio for weather information.
- Lightning is a major threat during a thunderstorm. In the United States, between 75 to 100 Americans are hit and killed each year by lightning. If you are caught outdoors, avoid natural lightning rods such as tall, isolated trees in an open area or the top of a hill and metal objects such as wire fences.
- The typical thunderstorm is 15 miles in diameter and lasts an average of 20 to 30 minutes. Of the estimated 100,000 thunderstorms that occur each year in the United States, only about 10 percent are classified as severe.
- It is a myth that lightning never strikes twice in the same place. In fact, lightning will strike several times in the same place in the course of one discharge.
- Some thunderstorms can be seen approaching, but others hit without warning. It is important to learn and recognize the danger signs and to plan ahead.
- Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall. "Heat lightning" is actually lightning from a thunderstorm too far away for thunder to be heard. However, the storm may be moving in your direction.
- You are in danger from lightning if you can hear thunder. Because light travels so much faster than sound, lightning flashes can sometimes be seen long before the resulting thunder is heard. When the lightning and thunder occur close together, the lightning is striking nearby.
- To estimate the number of miles you are from a thunderstorm, count the number of seconds between a flash of lightning and the next clap of thunder. Divide this number by five.
- Many strong thunderstorms produce hail. Hail, which can be smaller than a pea or as large as a softball, can be very destructive to automobiles, glass surfaces (skylights and windows), roofs, plants, and crops. In a hailstorm, take cover immediately. Because pets and livestock are particularly vulnerable to hail, bring them into shelter before storms begin.
- Downbursts and straight-line winds associated with thunderstorms can produce winds 100 to 150 miles per hour; enough to flip cars, vans, and mobile homes. The resulting damage can equal the damage of most tornadoes. If a severe thunderstorm warning is issued, leave structures that are susceptible to being blown over in high winds.

Adapted from resource material developed by the Federal Emergency Management Agency and the National Weather Service